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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,006	01/15/2002	Scott M. Hartley	101-27	6356

24336 7590 08/22/2005

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EXAMINER	
ZACHARIA, RAMSEY E	
ART UNIT	**PAPER NUMBER**
1773	

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/047,006	HARTLEY ET AL.	
	Examiner	Art Unit	
	Ramsey Zacharia	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4,9,12-21,23-28,30,34-36 and 38-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,9,12-21,23-28,30,34-36 and 38-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 31 May 2005 has been entered.

Information Disclosure Statement

3. Reference "DT 2261388" in the information disclosure statement filed 31 May 2005 has been lined through for failing to comply with both 37 CFR 1.98(a)(2) (requiring a legible copy of each cited foreign patent document) and 37 CFR 1.98(a)(3) (requiring a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language.)

Claim Objections

4. Claims 13-18 are objected to because of the following informalities: "exhibiting" on line 2 of each claim should be --exhibits--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. Claims 1, 2, 4, 9, 12-21, 23-28, 34-36, and 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones et al. (WO 00/20157) in view of Ullmann's Encyclopedia of Industrial Chemistry (5^{th} Edition, Volume A18: Paints and Coatings).

Jones et al. teach a welded workpiece formed by exposing the joint region at the weld to radiation so as to melt the surface of one or both pieces at the joint, then allowing the melted material to cool and weld the workpiece together (page 1, lines 27-33). A radiation absorbing material is provided in the joint region (page 1, lines 34-36). The radiation absorbing material is an NIR dye having a high molar absorption coefficient, good solubility in the host polymer, and does not degrade to colored by-products (page 3, lines 10-20). The dyes also have high extinction coefficients (page 3, lines 29-32). The dye can be incorporated into the joint region as a coating solution applied to the surface by painting (page 4, line 22-page 5, line 34). A suitable concentration of the dye is 0.001-0.1 $\mu g/mm^2$, i.e. 1-100 ng/mm^2 (page 10, lines 16-34). The dye dissolved in a suitable solvent may be painted over the joint region with resultant deposition of the dye both at the surface and infusion of the dye very slightly into the substrate of thin polyethylene or polyetheretherketone films or other polymeric substrates (page 11, lines 3-13). The surface of the workpiece of Jones et al. reads on a "reflective surface" as recited in the

claims because it is made of a polymer which softens on heating and the claims do not require any degree of reflectivity.

Because the radiation absorbing material in the joint region of Jones et al. appears to be the same as that used in the instant invention (i.e. 1-100 ng/mm^2 of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product) it is taken to inherently be capable of converting inbound radiant energy at a welding wavelength over about 0.1 J/mm^2. Moreover, because the dye is miscible in the polymer (as evidenced by the teaching that the dye may be incorporated into a polymer film or the polymer workpiece itself), the degradation by-products should also be miscible in the polymer.

Regarding claim 9, the depth to which the dye penetrates when applied as a coating onto the surface of one of the workpieces must inherently be sufficiently small to avoid foaming during welding since Jones et al. do not teach that the welding causes foaming. Moreover, if foaming were present, the appearance of the joint would be affected. That the welding process Jones et al. does not affect the appearance of welded joint indicates that there is no foaming.

Regarding claim 12, the transmission through the joint region of Jones et al. at the welding wavelength is lower than the optical transmission though the bulk portions because the joint region is designed to absorb energy at the welding wavelength and the bulk portions are designed to be optically transparent. The radiation absorbing material in the joint region of Jones et al. is taken to inherently be capable of converting the radiation into thermal energy via successive electronic-to-thermal and chemical-to-thermal conversion activities because it is designed to heat up the joint region and the material appears to be the same as used in the instant

invention (i.e. 1-100 ng/mm^2 of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product).

Regarding the optical properties recited in claims 13-21, since the material used by Jones et al. appears to be the same as that used in the instant invention (i.e. 1-100 ng/mm^2 of an NIR dye having high absorption and extinction coefficients that degrades to a non-colored by-product), it should inherently have the same optical properties.

Jones et al. do not teach the concentration of the dye in the coating solution.

However, Jones et al. do teach that the dye may be applied to the joint region as a coating composition to a final coating weight of 1-100 ng/mm^2. The concentration of the coating solution affects the coating weight of the final product. That is, the concentration is a results effective variable.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the concentration of dye in the coating solution, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2nd 272, 205 USPQ 215 (CCPA 1980).

Jones et al. do not explicitly recite that the paint has a necessary viscosity, surface tension, and drying time to provide a substantially laminar welding zone with a defined edge. However, Jones et al. do teach that applying the dye by painting offers flexibility in that only selected areas can be treated (page 5, lines 25-27). That is, Jones et al. teach that applying the dye by painting allows for coating a defined area the outer border of which demarcates a defined edge.

Ullmann's Encyclopedia of Industrial Chemistry illustrates that paints comprises as a basic component a film forming substrate such as cellulose nitrite or vinyl chloride polymers, i.e. thermoplastic materials (page 364, column 2). Various additives may conventionally be incorporated into paints, such as driers and leveling agents (page 365, column 2-page 366, column 1). Finally, paints comprise a solvent composition selected to adjust the viscosity and improve wetting (i.e. surface tension) and leveling. That is, Ullmann's Encyclopedia of Industrial Chemistry demonstrates that viscosity, surface tension, and drying time are well understood processing parameters for paints to be used as coatings and that it requires no more than ordinary skill in the art to adjust the paint composition to provide for a smooth final coating.

Therefore, it would have been obvious to one skilled in the art to select as a paint composition, a composition with appropriate viscosity, surface tension, and drying time to provide a smooth coating over the joint region. One of ordinary skill would desire to provide a smooth coating in order to maintain a uniform concentration of NIR dye across the joint region and thus yield a uniform weld. A smooth coating results in the formation of a substantially laminar welding zone.

Response to Arguments

6. Applicant's arguments filed 31 May 2005 have been fully considered but they are not persuasive.

The applicants argue that Jones et al. uses a liquid coating with a porous fabric as opposed to a reflective surface. While fabrics can absorb and contain liquids, it is argued that

any suggestion to apply an unadulterated liquid to a reflective surface would likely fail to produce a laminate welding zone with a defined edge and uniform density throughout the zone.

This is not persuasive for the following reasons. First, Jones et al. does not use a liquid coating only in conjunction with fabrics. On page 11, lines 3-18, Jones et al. explicitly teach painting a coating composition in a suitable solvent onto polymer films. Moreover, as demonstrated by Ullmann's Encyclopedia of Industrial Chemistry, the selection of suitable solvents and additives to yield a smooth coating from a liquid coating composition is old and well understood in the art. As such, it is well within the ability of one skilled in the art to optimize the paint formulation such that the final product comprises a smooth coating with a uniform concentration of dye.

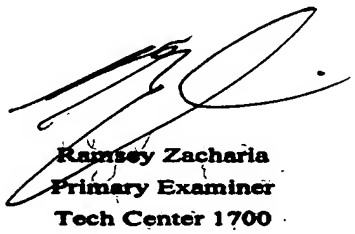
Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramsey Zacharia whose telephone number is (571) 272-1518. The examiner can normally be reached on Monday through Friday from 9 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney, can be reached at (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ramsey Zacharia
Primary Examiner
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